

Remarks/Arguments:

Claims 5-28 are currently pending in the present application, in which claim 7 is currently amended to correct a discovered informality. No new matter is introduced.

The Office Action dated October 7, 2005 rejected claims 5 and 6 under 35 U.S.C. § 102(e) as anticipated by *Foschini et al.* (U.S. Patent No. 6,763,073 B2), claims 7-12, 14-19, 21, 22, 24, 25, 27, and 28 under § 103(a) as obvious over *Nagatani* (U.S. Pub. No. 2003/0067904 A1) in view of *Gerlach et al.* (U.S. Patent No. 5,471,647), and claims 13, 20, 23, and 26 under § 103(a) as obvious over *Nagatani* in view of *Gerlach et al.* and further in view of *Foschini et al.*

Applicant respectfully traverses the rejections on the merits for the reasons proffered below.

Independent claim 5 recites “generating the feedback information **based on prediction of future propagation measurements.**” To satisfy this feature, the Office Action, on page 2, refers to Figs. 1 and 2, col. 3, line 48 – col. 4, line 47 of *Foschini et al.* Applicant respectfully submits that *Foschini et al.* provides no such disclosure. Instead, *Foschini et al.*, col. 4: 4-24, states the following (Emphasis Added):

The selection of transmitter antennas is then somewhat optimized based on information provided by receiver 200 to transmitter 100 via the feedback channel (represented in FIG. 1 by the dashed line.) Transmitter processor 100, more particularly, may be arranged to initially match the sequential order in which symbols are generated with the order of antennas 110-1 through 110-k, in which the first of such symbols is transmitted over antenna 110-1, the second symbol is then transmitted over antenna 110-2, and so on. If that selection turns out to be inferior based on the receiver feedback information, then transmitter processor 100 may change the selection or use a subset of the transmit antennas 110-1, all in accordance with an aspect of the invention. For example, as a result of such feedback, **if the transmitter "learns" that the environment of the channel over which antennas 110-k-1 and 110-k transmit, then processor 100 may use just a subset of the antennas**, e.g., 110-1 through 110-k-2, and select those antenna that may possibly result in the best reception at receiver 200 as reported via the feedback channel.

The above passage, at best, describes use of a feedback channel in general terms. In fact, the feedback information is used to “learn” the present environment. Therefore, there is no support for “generating the feedback information **based on prediction of future propagation measurements.**” Further, *Foschini et al.* discloses this learning process merely follows the conventional learning technique (col. 6: 59-67).

In further support of this anticipation rejection, the Office Action refers to an “estimated signal,” (page 2, item 2), presumably for a teaching of “**prediction of future propagation measurements.**” This interpretation has no support within *Foschini et al.* However, within the cited passage of col. 3, line 48 – col. 4, line 47, the only mention of any estimate is that of the m QAM components of the vector $q(t)$. In the context of the claim, these components have no relevance to the “**prediction of future propagation measurements.**”

As anticipation requires the disclosure of each element of the claim under consideration to be in a single prior art reference, Applicant respectfully submits that independent claim 5, along with claim 6 depending therefrom, is not anticipated by *Foschini et al.*

With regard to the § 103(a) rejection of claims 7-12, 14-19, 21, 22, 24, 25, 27, and 28, Applicant respectfully submits that the Examiner has not established a *prima facie* case of obviousness. A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

Independent claims 7, 14, 21, 24 and 27, each recites “wherein the first pilot signal and the second pilot signal **are identical.**” The Office Action, on page 3, item 4, asserts that this feature is taught by *Nagatani et al.*, citing Figs. 9 and 10 along with paragraphs [0075] and [0076]. Applicant respectfully submits that in fact *Nagatani et al.* teaches away this claimed feature. *Nagatani et al.* states the following (Emphasis Added):

[0075] **Unless the signal-point position vectors** of the spread-spectrum modulated signals of respective channels **are shifted in phase, the pilot signals will be the same** on each of the channels and the output timings of the pilot signals on each of the channels will be identical. As a consequence, the power of the signal (the output signal of the code-multiplexed signal generator 52) obtained by code-multiplexing the spread-spectrum modulated signals of respective channels will develop peak values at the pilot signal portions, **these peak portions will produce interference in other stations and the power efficiency of the power amplifier will decline.**

[0076] Accordingly, **the phase shifter 65 in the spread-spectrum modulating unit 51.sub.1-51.sub.n of each channel shifts, by a predetermined angle channel by channel, the phase of the signal-point position vector** of the spread-spectrum modulated signal of each channel. For example, the phase shifter 65 of an *i*th channel makes the phase-shift angle θ_i of the *i*th channel equal to $360 \cdot \text{degree} \cdot i/N$ and phase-shifts the position vector by an amount equivalent to this phase-shift quantity θ_i , where *N* represents the number of channels. Alternatively, the phase shifter 65 of each channel stores amount of

phase shift in correspondence with spreading codes, obtains an amount of phase shift that conforms to the spreading code used in spread-spectrum modulation and rotates the signal by an amount equivalent to the phase-shift quantity. If this arrangement is adopted, the phases of the pilot signal portions of the spread-spectrum modulated signals output by the spread-spectrum modulators 51.sub.1-51.sub.n of the respective channels will be shifted relative to one another, **thus making it possible to suppress the peak values of the code-multiplexed signal, reduce the power of interference waves and raise the power efficiency of the transmitting power amplifier 56.** In this case, the phases of the signal-point position vectors of the spread-spectrum modulated signals may be shifted by a prescribed angle with regard to all transmission data and pilot signals, or the phases of the position vectors of the spread-spectrum modulated signals may be shifted by a prescribed angle with regard solely to the pilot signals.

In view of the above description, the *Nagatani et al.* system teaches away from the use of identical pilot signals, as it is desirable to introduce phase-shifts to achieve different pilot signals. For example, Figs. 9 and 10 also show differentiated pilot signals by providing a column in which the pilot signal of each discrete channel has a distinctly different phase angle. Corresponding textual support for Figs. 9 and 10 is provided by paragraphs [0100] and [0102], respectively. Paragraph [0100] specifically recites, "Fig. 9 illustrates control of phase rotation through the angles $0, \pi/2, \pi, 3\pi/2$ given by Equation (1), applied solely to the pilot signal portions of the spread-spectrum modulated signal, while paragraph [0102] declares, "Fig. 10 illustrates control of phase rotation through the angles $\theta_0\text{-}\theta_{N-1}$ given by Equation (4), applied solely to pilot signal portions of the spread-spectrum modulated signal." Thus, *Nagatani et al.* teaches away from the use of a first and second pilot signal that is "identical" as positively recited in the claims.

The addition of *Gerlach et al.* does not cure the deficiency of *Nagatani et al.*, as the reference is applied merely for a supposed teaching of "determining weights." (Office Action, page 3). In particular, *Gerlach et al.* expressly recites, "a method is disclosed for using feedback to minimize cross-talk among **different** transmitted signals." (col. 2, lines 41-43) (emphasis added). Moreover, the applied art is devoid of any reference to pilot signals.

Thus, a *prima facie* case of obviousness has not been established. Accordingly, Applicant respectfully request withdrawal of the obviousness rejection and urges the indication that claims 7-12, 14-19, 21, 22, 24, 25, 27, and 28 are allowable.

As for the obviousness rejection of dependent claims 13, 20, 23, and 26 over *Nagatani* in view of *Gerlach et al.* and further in view of *Foschini et al.*, Applicant asserts that the combination is

Appl. No. 09/896,646
Amdt. Dated: January 9, 2006
Reply to Office Action of October 7, 2005

impermissible, as explained with respect to the obviousness rejection over the *Nagatani* and *Gerlach et al.* Hence, claims 13, 20, 23, and 26 should be indicated as allowable.

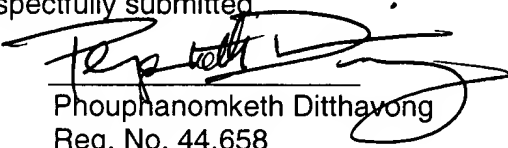
Applicant submits that all pending claims are now in condition for allowance. A Notice of Allowance is respectfully requested.

Date:

1/9/06

Respectfully submitted,

By:


Phouphanomketh Ditthavong
Reg. No. 44,658

Henrik Keshishian
Reg. No. 54,623

Nokia, Inc.
12278 Scripps Summit Dr.
San Diego, CA 92131
858-831-5875 Office
858-449-1357 Mobile
Henrik.Keshishian@nokia.com